UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,509	03/29/2004	David Clarence Mullen	4366-161	7396

48500 7590 03/23/2009

SHERIDAN ROSS P.C.
1560 BROADWAY, SUITE 1200
DENVER, CO 80202

EXAMINER	
NGUYEN, KHAI N	
ART UNIT	PAPER NUMBER
2614	
MAIL DATE	DELIVERY MODE
03/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/813,509	MULLEN, DAVID CLARENCE	
	Examiner	Art Unit	
	KHAI N. NGUYEN	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16, 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on December 17, 2008 has been entered. Claims **1**, 3-4, **15**, and **20** have been emended. Claims 17 and 23 have been canceled. No claims have been added. Claims 1-16, and 18-22 are still pending in this application, with claims **1, 15,** and **20** being independent.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Objections

3. Claim 2 is objected to because of the following informalities: Claim 2 (dependent claim of claim 1) recites "- - -, wherein said first resource comprises a first agent, - - -", but "wherein said first resource comprises a first agent" is already recited in the amended independent claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. Claims 1-12 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions (*In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008)) indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a

particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

For example, claim 1 appears to have a mere manipulation of data (selecting, determining, combining, normalizing, applying), and does not have any tangible, useful and concrete result. Selecting "a forecast horizon", determining "a first probability and a second probability of the availability of an agent", combining "first and second probabilities", normalizing "a result of combining", and applying "probability of agent availability" can be done by an agent/person. Applicant has provided no explicit and deliberate definitions of "selecting", "determining", "combining", "normalizing" or "applying" to limit the steps to the electronic form of the "probability of agent availability". No practical application is provided and all of the recited steps can be performed by a supervisor/person or by the use of a pencil and paper.

Claim Rejections - 35 USC § 103

5. Claims 1-16, 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over David (US Patent Number 5,640,445) in view of Mullen (U.S. Publication 2003/0018762 A1).

---

[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk*

Regarding claims 1 and 13-14, David teaches a method for forecasting availability of a resource for a work assignment (Figs. 1-4, column 2, lines 64-65, i.e., call assignments method in which agent availability and call answers are based on probability statistics), wherein said method comprises the execution of program instructions that are recorded in a computer readable storage medium, wherein said method is performed by operation of a logic circuit (Fig. 1, 11 CPU Call Manager, 13 Call Processor, 15 Hard Disk Storage, column 1, lines 23-44, i.e., CPU and Call Processor read on a logic circuit, and a memory such as hard disk storage reads on computer storage medium), comprising:

selecting a forecast horizon (Fig. 2, 10, IDLE AGENT PREDICTION, AGENT TALK TIME, AGENT AFTER-CALL WORK TIME “wrap-up", column 4, lines 20-26, i.e., probability for agent talk times and after-call work “wrap-up” to forecast agent availability within a time window);

determining for a first segment (Fig. 3, AGENT TALK TIME) of a first task a first probability (Fig. 3, PDF1 Probability Density Function) related to an availability of at least a first resource within said forecast horizon (Fig. 3, column 4 lines 22-26, and column 5, lines 48-57, wherein a probability density function for agents engaged in a call reads on “a first segment of a first task a first probability”), wherein said first resource comprises a first agent (Fig. 3, AGENT 1 TALK TIME "first agent", column 4, lines 28-32);

---

v. Benson, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

determining for a second segment (Fig. 4, AGENT AFTER-CALL WORK) of said first task a second probability (Fig. 4, PDF2) related to said availability of said at least a first resource within said forecast horizon, wherein said first and second probabilities are different from one another (Fig. 4, column 4 lines 22-26, and column 5, lines 58-67, wherein a probability density function for agents engaged in a after-call work reads on "a second segment of a first task a second probability");

combining said determined first probability and said determined second probability; and normalizing a result of said combining said determined first and second probabilities (Figs. 3-4, column 7, lines 35-37, i.e., the sum calculated for each agent is used to obtain a probability of the agent availability).

applying said obtained probability of agents availability to assign work to a resource (Figs. 3-4, column 4, lines 10-14, and column 7, lines 6-9, and lines 35-37).

However, David does not specifically disclose obtaining a probability of individual agent availability within said selected forecast horizon by combining the probabilities of the segments for that individual agent. Although David teaches segmenting a task into first segment probability (Fig. 3, AGENT TALK TIME) and second segment probability (Fig. 4, AFTER-CALL WORK), and then combining these probabilities (Figs. 3-4, column 6, line 60 through column 7, line 9). And thus, the probability of individual agent availability within the selected forecast horizon can be considered inherent by design, since the individual probability is obtained before combining as the sum of the availabilities.

In the same field of endeavor, Mullen teaches to obtain a probability of individual agent availability within said selected forecast horizon (Mullen, Fig. 1, 122 Resource Task Completion Forecaster, Figs. 2-3, paragraph [0007], and paragraph [0018], lines 7-20). Mullen further teaches that there is a need to assign the available resource to high-priority work (Mullen - paragraph [0010]).

Therefore, it would have been obvious to a person of ordinary in the art at the time of the invention was made to incorporate the use of a probability of individual agent availability within said selected forecast horizon, as taught by Mullen, into the method and system of David in order to enhance the forecasting of agents availability. Since, David teaches segmenting a task into first segment probability and second segment probability, and then combining these probabilities, and thus adding a probability of individual agent availability within said selected forecast horizon is to apply a known technique to a known device ready for improvement to yield predictable results (see KSR – MPEP 2143). One having ordinary skill in the art would have been motivated to make such a modification to ensure the assigning of the available resource to high-priority work, as per the teachings of Mullen.

Regarding claim 2, David teaches the method, wherein said first resource comprises a first agent (Fig. 3, AGENT 1 TALK TIME), wherein said first probability (Fig. 3, PDF1 Probability Density Function) comprises a probability that said first agent will complete a talk state within said selected horizon, said first probability derived from a

time said agent has been in said talk state and a probability distribution for agent time in said talk state (Fig. 3, column 4 lines 22-26, and column 5, lines 48-57),

and wherein said second probability (Fig. 4, PDF2) comprises a probability that said first agent (Fig. 4, AGENT 1 AFTER-CALL WORK TIME "wrap-up") will complete a wrap-up state within said selected time horizon, said second probability derived from a probability distribution for agent time in said wrap-up state (Fig. 4, column 4 lines 22-26, and column 5, lines 58-67).

Regarding claims 3 and 4, David teaches the method, wherein said first probability (Fig. 3, PDF1) is determined for an actual time said at least said first agent has been in said talk state (Fig. 3, AGENT 1 TALK TIME), and wherein said second probability (Fig. 4, PDF2) is determined for zero time in said wrap-up state (Fig. 4, AGENT 1 AFTER-CALL WORK TIME "wrap-up"), and wherein said first probability comprises a combination of a probability that said first agent will complete a talk state within said selected forecast horizon and a probability that said first agent will complete a wrap-up state within said selected forecast horizon, and wherein said second probability comprises a probability that said at least a first agent will complete a total handle time state within said selected forecast horizon (Fig. 1, 11, Figs. 3-4, column 4, lines 29-41).

Regarding claims 5 and 6, David teaches a method wherein said combining comprises adding said first and second probabilities; and calculating a product of said

determined first probability and said determined second probability, and wherein said normalizing comprises dividing said product by two (Fig. 5, column 6, lines 10-17).

Regarding claim 7, David discloses everything claimed as applied above (see claims 1 and 2). However, David does not specifically disclose the detail to compute the variances. Although David has disclosed a priori probability and the weighted forecasts (Figs. 1-5, column 4, lines 10-13, column 5, lines 48-67, and column 7, lines 10-15). Mullen teaches a forecaster to compute variances of completion of servicing the call within the selected forecast horizon (Mullen, Fig. 1, 122, Fig. 2, 214, paragraph [0020], paragraph [0057]-[0058]).

It would have been obvious to a person of ordinary in the art at the time of the invention was made to apply a known technique to a known device (i.e., computing the variances of completion of servicing the call) ready for improvement to yield predictable results (see KSR – MPEP 2143). Therefore, it would have been obvious to a person of ordinary in the art to incorporate the computing of the variances, as taught by Mullen, into the method and system of David in order to enhance the prediction of the agent availability to service the calls.

Regarding claim 8, David teaches the method comprising: determining an a priori probability of completion of said talk state before an amount of time equal to an amount of time said first agent has been in said talk state has elapsed; computing a product of said a priori probability and said first ratio to obtain a first weight (Fig. 5, PDF1

WEIGHT); computing a product of said first weight and said first forecast to obtain a first weighted forecast; subtracting said first weight from one to obtain a second weight; computing a product of said second weight (Fig. 5, PDF2 WEIGHT) and said second forecast to obtain a second weighted forecast; and computing a composite forecast by computing a sum of said first weighted forecast and said second weighted forecast (Fig. 5, CALCULATED PDF1 WEIGHT, CALCULATED PDF1 WEIGHT, column 5, lines 48-67, and column 6 line 51 through column 7 line 9).

Regarding claims 9-10, and 16, David teaches the method, wherein a probability of arrival is calculated for a plurality of resources, wherein said probabilities of arrival for each of said plurality of resources are combined to obtain said first forecast, and wherein said combining said agent arrival probabilities for each of said plurality of agents to obtain a first forecast comprises: aggregating a supply of agents as a sum of probabilities of arrival of each individual agent included in said supply of agents. (Figs. 3-5, column 7, lines 6-40).

Regarding claims 11-12, David teaches the method, wherein said selected forecast horizon comprises a forecast time until an outbound call is completed to a live person, and comprising using said first forecast to determine whether or not to place an outgoing call (Figs. 1-5, CALCULATE NUMBER OF CALLS TO DIAL, column 7 lines 35-40).

Regarding claim 15, David teaches a method for forecasting arrivals of agents (Figs. 1-4, column 2, lines 64-65, i.e., call assignments method in which agent availability and call answers are based on probability statistics), comprising:

selecting a forecast horizon; forecasting using an automatic call distributor (Fig. 1, 11, CALL MANAGER CPU, 13 CALL MANAGER) the number of agents associated with the automatic call distributor that are available within said selected horizon, said forecasting including (Fig. 2, 10, IDLE AGENT PREDICTION, AGENT TALK TIME, AGENT AFTER-CALL WORK TIME “wrap-up", column 4, lines 20-26, i.e., probability for agent talk times and after-call work “wrap-up” to forecast agent availability within a time window):

determining a probability of completion of talk state (Fig. 3, AGENT TALK TIME for AGENT #1 to AGENT #N) within the forecast horizon for each of a plurality of agents (Fig. 3, column 4 lines 22-26, and column 5, lines 48-57);

determining a probability of completion of wrap-up state (Fig. 4, AGENT AFTER-CALL WORK “wrap-up” for AGENT #1 to AGENT #N) within the forecast horizon for each of said plurality of agents assuming each is at the start of wrap-up (Fig. 4, column 4 lines 22-26, and column 5, lines 58-67);

for each of said plurality of agents, combining said determined probability of completion of talk state (Fig. 3, Sum of Weights for PDF1) and said determined probability of completion of wrap-up state (Fig. 4, Sum of Weight for PDF2); combining said agent arrival probabilities for each of said plurality of agents to obtain a first

forecast (Figs. 3-4, column 7, lines 35-37, i.e., the sum calculated for each agent is used to obtain a probability of the agent availability), and

initiating an outbound call when said first forecast indicates an excess supply of agents (column 8 lines 28-33).

However, David does not specifically disclose to obtain a probability of individual agent availability within said selected forecast horizon by combining the probabilities of the segments for that individual agent. Although David teaches segmenting a task into first segment probability (Fig. 3, AGENT TALK TIME) and second segment probability (Fig. 4, AFTER-CALL WORK), and then combining these probabilities (Figs. 3-4, column 6, line 60 through column 7, line 9). And thus, the probability of individual agent availability within the selected forecast horizon can be considered inherent by design, since the individual probability is obtained before combining as the sum of the availabilities.

In the same field of endeavor, Mullen teaches to obtain a probability of individual agent availability within said selected forecast horizon (Mullen, Fig. 1, 122 Resource Task Completion Forecaster, Figs. 2-3, paragraph [0007], and paragraph [0018], lines 7-20). Mullen further teaches that there is a need to assign the available resource to high-priority work (Mullen - paragraph [0010]).

Therefore, it would have been obvious to a person of ordinary in the art at the time of the invention was made to incorporate the use of a probability of individual agent availability within said selected forecast horizon, as taught by Mullen, into the method

and system of David in order to enhance the forecasting of agents availability. Since, David teaches segmenting a task into first segment probability and second segment probability, and then combining these probabilities, and thus adding a probability of individual agent availability within said selected forecast horizon is to apply a known technique to a known device ready for improvement to yield predictable results (see KSR – MPEP 2143). One having ordinary skill in the art would have been motivated to make such a modification to ensure the assigning of the available resource to high-priority work, as per the teachings of Mullen.

Regarding claim 18, David discloses everything claimed as applied above (see claim 15). However, David does not specifically disclose an amount of time an agent is occupied by a lower priority task. Although David has disclosed to predict time to a live disposition on outbound calls (Fig. 6, column 4, lines through column 5 line 6). Mullen teaches the detail that the resources could be assigned to lower priority tasks (Mullen – paragraph [0006], and paragraph [0010]).

It would have been obvious to a person of ordinary in the art at the time of the invention was made to apply a known technique to a known device (i.e., to recall an agent from lower priority work to work comprising servicing an outbound call) ready for improvement to yield predictable results (see KSR – MPEP 2143). Therefore, it would have been obvious to a person of ordinary in the art to incorporate the use of priority, as taught by Mullen, into the method and system of David in order to enhance the prediction of the agent availability to service the calls.

Regarding claim 19, David teaches the method, wherein said first forecast is provided as an input to a predictive dialer (Fig. 1, 11 CALL MANGER, Fig. 2, 16, column 5 lines 27-35).

Regarding claim 20, David teaches a work distribution system (Figs. 1-9), comprising:

means for predicting a time to a next work item requiring an agent (Fig. 1, Fig. 2, 10 IDLE AGENT PREDICTION);

means for accessing a first agent work segment statistic (Fig. 2, 10 AGENT TALK TIME);

means for accessing a second agent work segment statistic (Fig. 2, AGENT AFTER CALL WORK TIME);

means for determining a first probability (Fig. 3, PDF1) of completing said first agent work segment (Fig. 3, AGENT TALK TIME) within said predicted time at an elapsed time in said first work segment by applying at least said first agent work segment statistic (Fig. 3, column 4 lines 22-26, and column 5, lines 48-57);

means for determining a second probability (Fig. 4, PDF2) of completing said second agent work segment (Fig. 4, AGENT AFTER CALL WORK TIME) within said predicted time at zero elapsed time in said second work segment by applying at least said second agent work segment statistic (Fig. 4, column 4 lines 22-26, and column 5, lines 58-67); and

means for placing outbound calls, wherein said agent arrival probability is provided as an input to said means for placing outbound calls (Figs. 1-5, CALCULATE NUMBER OF CALLS TO DIAL, column 7 lines 35-40).

However, David does not specifically disclose to obtain a probability of individual agent availability within said selected forecast horizon by combining the probabilities of the segments for that individual agent. Although David teaches segmenting a task into first segment probability (Fig. 3, AGENT TALK TIME) and second segment probability (Fig. 4, AFTER-CALL WORK), and then combining these probabilities (Figs. 3-4, column 6, line 60 through column 7, line 9). And thus, the probability of individual agent availability within the selected forecast horizon can be considered inherent by design, since the individual probability is obtained before combining as the sum of the availabilities.

In the same field of endeavor, Mullen teaches to obtain a probability of individual agent availability within said selected forecast horizon (Mullen, Fig. 1, 122 Resource Task Completion Forecaster, Figs. 2-3, paragraph [0007], and paragraph [0018], lines 7-20). Mullen further teaches that there is a need to assign the available resource to high-priority work (Mullen - paragraph [0010]).

Therefore, it would have been obvious to a person of ordinary in the art at the time of the invention was made to incorporate the use of a probability of individual agent availability within said selected forecast horizon, as taught by Mullen, into the method and system of David in order to enhance the forecasting of agents availability. Since,

David teaches segmenting a task into first segment probability and second segment probability, and then combining these probabilities, and thus adding a probability of individual agent availability within said selected forecast horizon is to apply a known technique to a known device ready for improvement to yield predictable results (see KSR – MPEP 2143). One having ordinary skill in the art would have been motivated to make such a modification to ensure the assigning of the available resource to high-priority work, as per the teachings of Mullen.

Regarding claim 21, David teaches the system, further comprising means for combining agent arrival probabilities for each of a plurality of agents to obtain said agent arrival probability within said predicted time (Fig. 3, Sum of Weights for PDF1, Fig. 4, Sum of Weight for PDF2, column 7, lines 35-37, i.e., the sum calculated for each agent is used to obtain a probability of the agent availability).

Regarding claim 22, David teaches the system, further comprising: means for accessing a third agent work segment statistic (Fig. 3 AGENT TALK TIME for AGENT #1 to AGENT #N, Fig. 4, AGENT AFTER-CALL WORK TIME for AGENT #1 to AGENT #N), said third agent work segment spanning said first and second work segments; and means for determining a third probability of completing said third agent work segment within said predicted time at an elapsed time in said third work segment, wherein said means for combining comprises means for combining said first, second and third probabilities (Fig. 3, Sum of Weights for PDF1, Fig. 4, Sum of Weights for PDF2) to

obtain an agent arrival probability within said predicted time (Figs. 3-4, column 5 line 48 through column 6 line 9).

Response to Arguments

5. Applicant's arguments with respect to claims 1-16, and 18-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI N. NGUYEN whose telephone number is

(571)270-3141. The examiner can normally be reached on Monday - Thursday 6:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad F. Matar can be reached on (571) 272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. N. N./
Examiner, Art Unit 2614
03/16/2009

/Ahmad F. Matar/
Supervisory Patent Examiner, Art Unit 2614